A Precursor of the Darwins," by May M. Jarvis, M.A., University of Texas, Austin; "Fossil Tracks in the Del Rio Shale," by Professor J. A. Udden, Augustana College, Rock Island, Ill.; "Some Figures on the Cost of Train Service," by R. A. Thompson, C.E., chief engineer of the Texas Railroad Commission; "The Law of the Fall of Rivers and the Value of the Deduced Curve in River Improvements," by F. Oppikofer, C.E., Tarpon, Texas.

BOTANICAL NOTES

ANOTHER ELEMENTARY BIOLOGY

THE recently published (Macmillan) "First Course in Biology" prepared by Bailey and Coleman is disappointing in that the presentation of the two sides of the subject is very unequal, that relating to plants being much inferior in every way to that relating to animals. Pedagogically, practically, and still more, scientifically the treatment of "Plant Biology" falls far below what we had a right to expect from the author. In the two hundred pages given to this subject there are brought out a great many interesting and useful facts, charmingly told, but they are presented in an unorganized form. There appears to be no orderly sequence in the presentation of the matter contained in the chapters. Thus the pupil is told in the first chapter that "no two plants are alike," which may or may not be important for him at this stage of his education; then next he is asked to consider plant adaptation, followed by two pages devoted to "the survival of the fit." The fourth chapter deals with "plant societies," the fifth with "the plant body," the sixth with "seeds and germination," the seventh and eighth with the root, etc. The twenty-third chapter includes six pages, devoted to "phenogams and cryptogams," a careful study of which must leave the pupil in a good deal of confusion as to the differences between spore-bearing and other plants, and the nature and significance of alternation of generations. The closing chapter consists of "more extended excursions into the cryptogamous orders." The author's unfamiliarity with this portion of the plant kingdom is evident. Witness this description of lichens (p. 195)—"they are thin, gray, ragged objects, apparently lifeless," and "they are now known to be green cells of various species of algæ overgrown and held together (imprisoned) by the mycelium of various kinds of fungi." What idea could a high-school pupil get from such statements? In the preface to the book the author refers approvingly to the "revolt against the laboratory method" and decries the study of botany "without really knowing plants"—but certainly this book in its present form is not likely to remedy these educational abuses. It must be remembered that even though one may intend to be very "practical," and have the gift of entertaining and attractive writing, it is still necessary to be strictly accurate in the statement of facts, and to carefully arrange the sequence in which these statements are presented. It is clear that the botanical part of this book should be revised, rewritten and rearranged before a second edition is issued.

CANADIAN ROCKY MOUNTAIN BOTANY

SOME time last year Mr. Stewardson Brown, the curator of the herbarium of the Academy of Natural Sciences of Philadelphia, brought out a pretty book on the "Alpine Flora of the Canadian Rocky Mountains" (Putnams). The author says it "is meant only as a guide to the rich and interesting flora of the Canadian Rockies and Selkirks, or those portions traversed by the Canadian Pacific Railway between Banff and Glacier." It is thus a tourist's book, but its treatment is such that it becomes a useful book for the botanist, also.

It opens with a glossary of such terms as might puzzle the non-botanical amateur, and following this is a good key to the families. In the text the characterization of the families is brief and non-technical, as are also the descriptions of species. The genera are not characterized further than is done in the keys to the genera given at the beginning of each family. It should be stated that the nomenclature is of the modern kind. At frequent intervals are plates, either half-tones of photographs, or colored reproductions of water-

color drawings. A good index closes this volume, which must prove very useful to tourist or botanist in the Canadian Rocky Mountains.

ORCUTT'S AMERICAN PLANTS

FEW eastern botanists can realize the difficulties of the student of systematic botany in the far west, where there are no handy manuals containing the descriptions of all the flowering plants and ferns and in some cases plants of lower groups also. For some years Mr. C. R. Orcutt, of San Diego, California, has attempted to remedy this condition by bringing together the descriptions of genera and species of south Californian plants. We have often wished that his type and paper were better, but work of this kind is a labor of love, and in the absence of an endowment must be brought out at the least possible expense. It is greatly to Mr. Orcutt's credit that he has been able to bring out this book of nearly two hundred pages of descriptions, many of which occur in widely scattered publications. From the title-page we learn that the volume contains "descriptions of over 200 genera, more than 1,200 species and many varieties." A second volume is in preparation, at the close of which we are promised an index to the two volumes. This will make the work much more useful, for with no index it is well-nigh impossible to find any particular description without the expenditure of much time. When these descriptions are all brought out, they should be put together in the form of a systematic manual of the plants of southern California.

A HIGH-SCHOOL BOTANY

NOTICE should be made here of Coulter's text-book of botany for secondary schools recently brought out by the Appletons in the excellent type, paper and presswork which is characteristic of their publications. The plan of the book is that which has been generally followed in recent years. There is first a general part (less than one hundred pages) in which gross and microscopical anatomy are taken up by the pupil, and this is followed by chapters on algae, fungi, liverworts, mosses, ferns, horsetails and club-mosses, gymnosperms and angiosperms, nearly one hundred and fifty pages being given to an admirable treatment of the morphology and general classification of the plants of these groups. Then follow two chapters (20 pages) on flowers and insects, and seed dispersal, and then 61 pages on the structure and classification of monocotyledons and dicotyledons. The remainder of the book (about 40 pages) is given to little snatches of discussions of plant breeding, forestry, plant associations, hydrophytes, xerophytes and mesophytes. Some of these closing chapters could well be omitted, since the necessarily brief treatment is wholly inadequate. However, taken as a whole the book is one of the best of those adapted to use in the high schools.

CHARLES E. BESSEY
THE UNIVERSITY OF NEBRASKA

SPECIAL ARTICLES

MENDELIAN HEREDITY

ONE might suppose, at first thought, that, in cases of Mendelian heredity, the dominant form would be capable of gaining over the recessive in the course of evolution, merely from the nature of the dominance. The falsity of this view was well shown by Shull (1907) and more recently by Hardy (1908). The successful increase of a mutation depends upon aid from determinate evolution or natural selection. Here we are only concerned with the work of the latter.

Shull maintains that the view that recessiveness is a handicap is quite erroneous; "not only has the dominant form no advantage in the competition which the newly arisen elementary species must encounter, but it can be shown that under certain conditions the reverse is true." He then clearly shows that, where the new characteristic has less favorable chances of survival at the time, recessiveness is an advantage, for it may be shielded from extermination by being carried without somatic expression.

But if we assume the opposite condition, namely, that the new characteristic is more favored than the parent species, then dominance gives an advantage because the characteristic will be present in each generation,